

ABSTRACT

5 An apparatus and method write data to a storage medium, and subsequently
automatically refresh the data to avoid loss of the data due to spontaneous thermal
degradation. The apparatus and method may check whether an indicator (also called
“refresh indicator”) if saved contemporaneous with writing of the data satisfies a
predetermined condition indicating that the data needs to be refreshed. If so, a
10 “refresh” operation is performed, wherein the to-be-refreshed data is read from and
written back to the same storage medium. The refresh indicator can be any parameter
that indicates a need to refresh the data prior to occurrence of one or more soft errors.
In one example, the apparatus and method read the data back contemporaneous with
writing of the data, and measure an amplitude of a readback signal and store, as the
15 refresh indicator, a predetermined fraction (e.g. half) of the measured value (i.e., a
threshold number). When a current value of the amplitude falls below the stored
value, the data is refreshed. In another example, a duration (or a fraction thereof) for
which the data can be read without any error is added to the current date, to compute a
date in future when the data needs to be refreshed, and the computed date is stored as
20 the refresh indicator. In this example, the apparatus and method determine if the
stored date is older than a current date, and if so perform the refresh operation, and
also recalculate and reset the stored date.